

Case Study III – Salmonellosis in Oregon

Objectives / Topics for Case Study III

1. Understanding public health's role in investigating natural outbreaks of disease
2. Recognizing that public health expects certain patterns or findings to explain natural disease outbreaks
3. Recognizing that certain unusual or unnatural findings in a disease investigation may suggest intentional / covert action
4. Identifying procedures and mechanisms to communicate suspicions of intentionality to law enforcement officials

Facts and Questions

Background: This scenario involves the September 1984 outbreak of gastroenteritis (an illness characterized by fever, vomiting, and diarrhea) caused by a specific bacterium, *Salmonella* Typhimurium. This specific bacterium is a member of a much larger family of salmonella bacteria. The outbreak occurred among persons living in the community of The Dalles, Oregon. The Dalles (1980 population: 10,500) is the county seat of Wasco County (population: 21,000) and a region of orchards and wheat ranches. The Dalles is located off Interstate 84 and is a frequent stop for travelers. From 1980 through 1983, there had been only 16 isolates of salmonella reported by the local health department (the Wasco-Sherman Public Health Department), and of these, only 8 were *Salmonella* Typhimurium. In 1981, followers of Bhagwan Shree Rajneesh purchased a large ranch in Wasco County to build a new international headquarters for the guru. Construction of the commune was controversial because of issues involving cultural values and land use. Part of the commune's ranch was incorporated as the city of Rajneeshpuram, but the charter was challenged in the courts, effectively limiting new construction. Commune members believed that the outcome of the November 1984 elections for Wasco County commissioners would have an important impact on further land-use decisions. One measure commune members took to further their interests was to implement a national program to bus hundreds of homeless persons to the commune for the purpose of registering these persons to vote in the election.

Facts I: On September 17, 1984, a disease control expert for the Wasco-Sherman Public Health Department began to receive reports of recent cases of gastroenteritis in persons who had eaten meals in either of two local restaurants in The Dalles several days before symptom onset.

Question 1: What is a county health department's responsibility when it receives reports of cases of illness among persons in a community, and what is the threshold for beginning an investigation?

Facts II: The disease control expert collected stool samples from recently ill persons and sent those samples to the state public health laboratory to be cultured. By the end of the week, cultures of stool samples obtained from about 15 persons were reported as being positive (+) for the bacterium, *Salmonella* Typhimurium, a bacterium known to cause gastrointestinal illness of the sort reported among people in the community. The disease control expert's preliminary investigation suggested that some persons with cases of gastroenteritis had eaten at salad bars at restaurants in the community before becoming ill. One week later, on about September 24, the disease control expert learned that there were additional cases of illness in the community and that some affected persons had been hospitalized because of their illnesses. As a result, the county health department contacted the Oregon Health Division (i.e., the state health department) on September 24, and the state contacted the CDC for assistance on September 25. In addition, because of the possible link between having eaten at salad bars and becoming ill, salad bars (but not entire restaurants) were closed.

Question 2: Under what conditions should a health department begin a full formal epidemiological investigation of a health problem?

Question 3: What are the usual procedures for investigating a possible food -borne disease outbreak?

Facts III: On September 26-27, two medical epidemiologists from the CDC arrived in The Dalles to provide assistance with the investigation. This assistance included identifying additional cases, collecting patient specimens, analyzing data, and assessing the basis for and impact of the intervention of closing the salad bars. Over the next 6 weeks, a public health team – which included persons from the local and state health departments and from the CDC – continued this extensive investigation, collecting additional data and samples, conducting numerous interviews, and carrying out complex studies. Ultimately, investigators identified a total of 751 persons with cases of *Salmonella* gastroenteritis. With an outbreak this large, investigators were initially optimistic that they would be able to find a common pattern or thread that could explain the occurrence of illness in so many people.

Despite these efforts, the investigators could not identify a single food item or contamination of a single food item that could have accounted for the *Salmonella* Typhimurium gastroenteritis outbreak. In the midst of this investigation, some residents of The Dalles contacted public health officials to express concerns about the possible suspicious behavior of some restaurant employees and of some religious commune members in relation to salad bars. These concerns included general rumors and a few very specific allegations. They raised questions about the possibility of the intentional contamination of food to cause illness within the community.

- Question 4: What circumstances should cause public health officials investigating an outbreak to suspect that the outbreak is intentional?
- Question 5: What should public health personnel do when specific allegations of intentionality are raised during the course of a public health investigation?
- Question 6: What law enforcement agency(ies) should be notified (e.g., local, state, or federal)?
- Question 7: What should law enforcement do in response to such reports and under what authority?
- Question 8: What factors may guide how law enforcement communicates with public health about such reports and vice versa?
- Question 9: In a situation such as in The Dalles, long after the exposures and outbreak may have occurred, how does the FBI / law enforcement approach the matter of collecting evidence and establishing a chain of custody? In this case, what is the evidence?

Facts IV: After receiving the initial reports of suspicious activity involving certain persons, public health personnel also began to interview restaurant managers about the behavior of disgruntled employees as a means for assessing the possible occurrence of an intentional act. These queries yielded no relevant information.

Question 10: What issues arise when public health personnel ask such questions as part of a public health epidemiologic investigation?

Question 11: Under these circumstances, FBI / law enforcement officials are primarily responsible for asking what questions ?

Facts V: Public health personnel remained in the field for over 6 weeks in order to complete the public health field investigation. At the end of this extensive investigation, they concluded that: (1) the illness was associated with salad bar consumption; and (2) because cases of illness occurred in two distinct time clusters, transmission of *Salmonella* Typhimurium probably involved some sort of complex transmission mechanisms. The investigators could neither rule out nor prove intentionality. The investigators recommended that all restaurant food handlers be healthy and have negative stool cultures before being permitted to return to work.

One year later, as part of a wiretapping and immigration fraud investigation of the religious commune, the FBI and other law enforcement officials received key information from informants who were members of the religious commune. This information indicated that, beginning in August 1984, members of the commune had intentionally contaminated salad bars with *Salmonella* Typhimurium for the purpose of influencing a local election to be held in November 1984. In October 1985, FBI and other law enforcement officials visited the commune's compound. During that visit, a vial of dried *Salmonella* Typhimurium (subsequently determined to be identical to the outbreak strain) was discovered by the state health department's laboratory director. He placed the vial into a chain of custody. In March 1986, indictments of some commune members were handed down. Two commune members, a nurse and the secretary to its leader, were convicted and sentenced.

Question 12: What is the "select agent" rule and how does it apply to *Salmonella* organisms?